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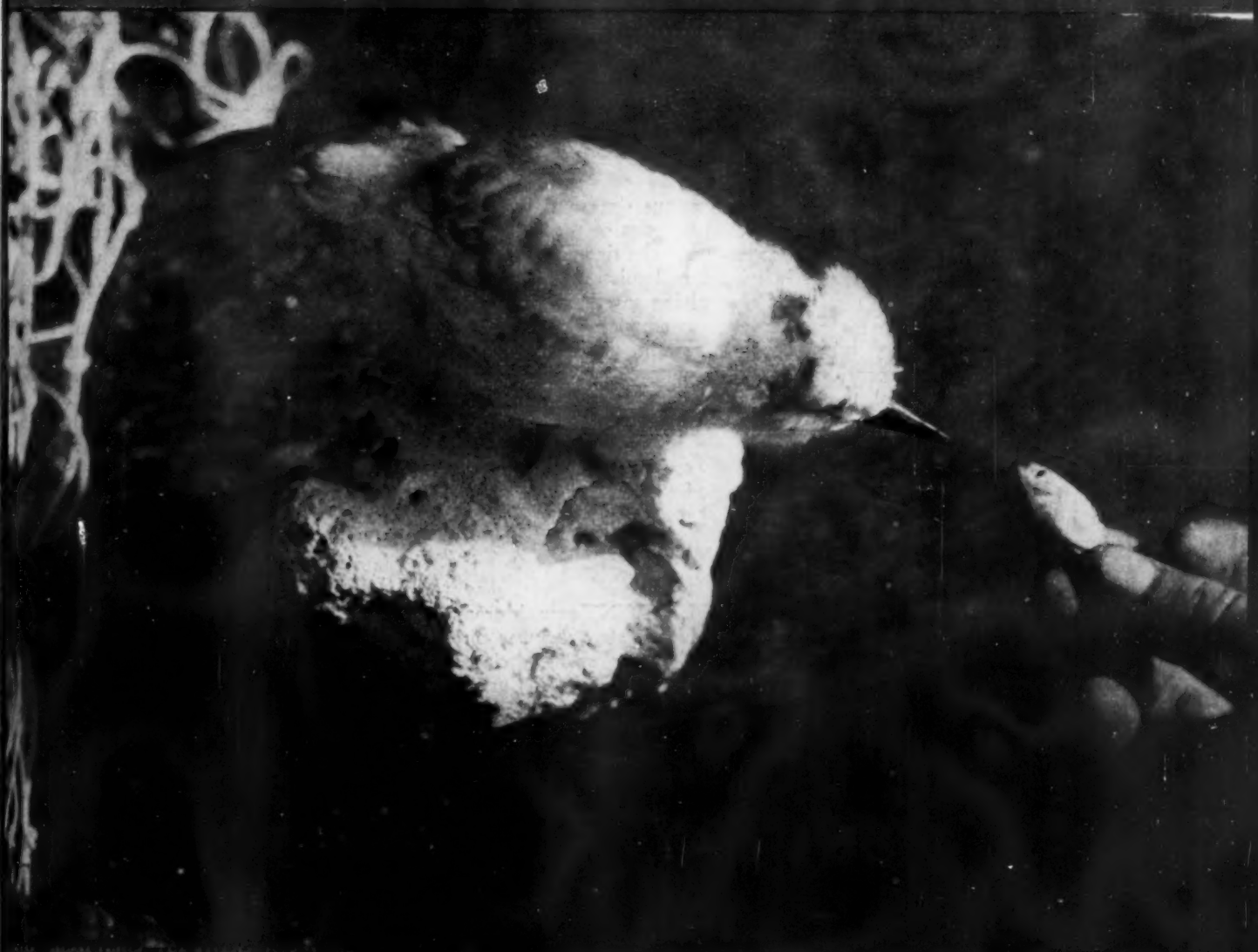
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE • OCTOBER 21, 1944



Chow Time

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A SCIENCE SERVICE PUBLICATION

CHEMISTRY

Plastics From Waste

Great piles of sawdust and sawmill wastes will supply enormous quantities of a new plastic, acetic acid and industrial alcohol.

➤ GREAT piles of sawdust and sawmill wastes, common in America's lumbering and milling sections, will supply the United States and perhaps other countries with enormous quantities of a new plastic, and with acetic acid, industrial alcohol and certain chemicals, obtained by a new process revealed at the meeting of the American Chemical Society in New York.

The announcement follows several years of experimental work carried out at the Polytechnic Institute, Brooklyn, N. Y., by Dr. Donald F. Othmer, Dr. Robert S. Aries and Dr. Raphael Katzen. The new process was discussed by them at the meeting.

The new plastic, they said, is similar to many other plastics now on the market, which, however, are made from more expensive materials. Reclaiming mill waste through the process would provide a plentiful source of raw material, thus releasing more plastics for civilian use even before the end of the war.

The utilization of mill wastes and sawdust for plastics and other products is carried out in the Polytechnic Institute work, by means of a continuous method of chemically adding water to wood. Following this method, the group at the Institute reported, they obtained from a ton of sawdust "more than 1000 pounds of a high-grade ingredient for plastics, as well as valuable chemicals as by-products, including 120 pounds of acetic acid, 60 pounds of furfural, and 500 pounds of sugar, which would make hundreds of pounds of alcohol."

The recovery of the chemicals, they explained, is done by a special treatment of the liquors under pressure which breaks down their molecular structure, followed by the addition of other chemicals to absorb the valuable constituents and eliminate the water and impurities by means of a washing process.

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Polymers and Plastics

➤ IT IS expected that after the war there will appear an even greater variety of plastics possessing a wide range of properties suitable for a great many more uses, Dr. Frederick T. Wall of the University of Illinois stated at another group meeting of the Chemical Society.

"Although the development of plastics calls for contributions from practically all branches of chemistry and physics, that portion of synthetic chemistry known as polymerization contributes most directly to these new developments," he said.

Polymers are made up of very large molecules, and can be made from certain types of small molecules, called monomers, by a polymerization process. Polymers are various combinations of monomers in various sizes and shapes. The physical properties of the bulk polymer depends upon the size and shape of the individual molecules.

Polymerizing together more than one kind of monomer, a process known as copolymerization, gives large molecules of various compositions. Dr. Wall offered a new theory of the nature of the structure of copolymers which should prove helpful in understanding many of the problems encountered by scientists in the plastics industry.

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Phosphor Crystals

➤ A RESPLENDENT new electronic era will be achieved after the war through the use of phosphor crystals, declared Dr. H. W. Leverenz of the Radio Corporation of America at the chemical meeting. "Phosphor crystals in fluorescent lamps will inexpensively illuminate workplaces and homes or gaily brighten the streets of our cities with varicolored sign tubing."

"Other phospor crystals will display news and entertainment on the screens of our television sets," he said. "Kindred phosphors in the screens of electron microscopes will aid in fathoming the mysteries of bacteria and molecules in order to ensure a healthier and happier life." Many other uses were also suggested by him.

Phosphor crystals are phosphorescent substances that absorb light and continue to shine in the dark. They have been known for centuries but not put into practical uses until now when electronic television research has devised highly efficient luminescent materials capable of glowing in practically any conceivable color.

Science News Letter, October 21, 1944

INVENTION

Controls on Home Furnaces Improved by New Devices

➤ FUEL CONTROL devices, several in number and timely with the present-day shortages of fuel, are among the 579 inventions of the past week on which patents were granted. One is a photo-electric-control automatic fuel shut-off for home oil and gas furnaces, claimed to be an improvement on earlier, somewhat similar devices. Another of particular interest saves fuel in large internal combustion engines by preventing them from running after the ignition has been shut off, a more or less common occurrence, due to pre-ignition, in aircraft, war tank, and other engines.

In the automatic fuel shutoff using the photoelectric control, light from the flame inside the combustion chamber in the furnace passes out through a small tubular opening in the front of the furnace to a photoelectric cell. The axis of the tubular opening and the axis of the flames are at an angle of from 30 to 45 degrees to each other as this gives the best results. When the light is cut off for any reason the cell actuates an electric control that operates a valve that regulates the flow of the fuel to the burner. It operates when the flame becomes extinguished, or if the mixture of fuel and air becomes too lean or too rich, thus decreasing the strength of the light.

Patent 2,360,166 was granted this device to Alfred F. Schumann of Lower Merion, Pa., and Alexander J. Turpin, Stewart Manor, N. Y., assignors to the Hauck Manufacturing Co., Brooklyn, N. Y.

The fuel control for internal combustion engines consists of a solenoid, which acts like an electromagnet, placed inside the housing of the degasser used in connection with the carburetor on heavy engines. When electrically energized, the solenoid operates a walking beam or lever and closes a throttle valve. The electric current to the solenoid is controlled by a switch on the dashboard.

The patentee is William E. Leibing, Detroit, Mich., who is assignor to Leibing-Fageol Co. of the same city. The patent is numbered 2,359,925.

Science News Letter, October 21, 1944

MEDICINE

Penicillin Saves Babies

Syphilis, in early stages, in expectant mothers is either cured or suppressed, stillbirth and miscarriage are averted, and apparently healthy babies born.

➤ FRESH triumphs for penicillin and one case of allergy to it are reported (*Journal, American Medical Association,* Oct. 14).

Early syphilis in expectant mothers is either cured or at least suppressed, miscarriage and stillbirth are averted and apparently healthy babies are born when the mothers are treated with penicillin, Dr. J. W. Lentz, Dr. Norman R. Ingraham, Jr., Dr. Herman Beerman and Dr. John H. Stokes, of Philadelphia, report.

Babies born with syphilis make a good response to penicillin treatment. Not enough time has elapsed to be sure whether mothers or babies are really cured of the infection and more study is needed to determine the best dosage of the mold chemical. The Philadelphia doctors, however, appear hopeful that penicillin may prove as good as or better than present treatment with arsenicals.

Penicillin combined with sulfa drugs saved 12 out of 13 patients suffering with meningitis due to pneumonia germs, a once 100% fatal disease, Dr. Antonio J. Waring, Jr., and Dr. Margaret H. D. Smith, of Baltimore, report. The penicillin-sulfa drug combination, they find, is more effective than either penicillin or sulfa drug alone or sulfa drug combined with serum.

Multiple boils following prickly heat or heat rash in babies, a common and often refractory problem in the south during warm weather, clear up more rapidly with penicillin than with any other known treatment, Dr. Rose Coleman and Dr. Wallace Sako, of New Orleans, report.

The case of acquired sensitivity to penicillin, analogous to drug or serum allergy, is reported by Dr. Leo H. Criep, of Pittsburgh.

It took the form of hives which showed as soon as a penicillin injection was given. The reaction continued until penicillin treatment was stopped.

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MEDICINE

Sinus Notion Debunked

The idea that once you have sinus disease, you always will have it, is called false. Sulfa drugs have been disappointing, penicillin offers more promise.

➤ GOOD NEWS for sinus sufferers appears in a report recently issued by the Mayo Clinic.

"Once sinus disease, always sinus disease" is branded as a "false notion" which it is hoped can be overcome.

The kind of treatment to be given and the question of whether an operation is necessary depends on whether the patient has fulminating sinusitis, acute sinusitis, a subacute or recurring acute form of the disease, chronic sinusitis or a mixture of allergic and infectious sinusitis. Treatment is primarily medical for acute, subacute and recurring acute sinusitis. It is primarily surgical for chronic sinusitis.

Sulfa drugs have proved disappointing, chiefly because the true identity of the infecting germs was not suspected. Penicillin in conjunction with suitable surgical procedures offers more hope.

Five serious complications of sinusitis, almost always fatal when present all together are: spreading osteomyelitis of the cranial bone, meningitis, brain abscess, abscess in the eye socket and cavernous sinus thrombosis. The treatment for these complications is their prevention. They are not always due to staphylococcus. Another germ, against which penicillin is definitely effective, has been found as the cause in these conditions.

Several patients with spreading osteomyelitis who would ordinarily have been expected to die have been cured by penicillin.

X-ray pictures are important not only for diagnosing the trouble but for showing the anatomic arrangement of the sinuses which varies in different persons. Such knowledge is important to the surgeon planning an operation.

The idea that the early morning postnasal drip, which sends many patients to their doctors, is sinus trouble is a false conception of sinusitis held by many patients and doctors.

The terms "radical" and "conservative" in connection with operations for sinusitis "should be avoided as making no sense." Preferred terms are "adequate" and "intelligent."

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ASTRONOMY

Amateurs May Find Comet By Searching Crater and Leo

➤ AMATEURS interested in rediscovering Comet Berry, discovered at Dunedin, New Zealand, the middle of September, should search in the constellations of Crater, the cup, Leo, the lion, and Sextans, the sextant, according to

FOR GUIDING SURGEONS' FINGERS—This shining steel device locates bullets and other foreign matter imbedded deep in wounded fighting men. A portable field X-ray machine device, shown here being assembled at the Westinghouse X-ray Division, measures the depth and position of the bullet. It also marks the patient's skin to enable the surgeon to position him on the operating table precisely as he was on the X-ray field table close to the combat area.

calculations made by L. E. Cunningham, Aberdeen, Md.

"The comet is likely to appear as a faint, fuzzy patch of light, and can be distinguished from the many nebulae in the region by its motion past the stars," Mr. Cunningham states. "When this motion has been definitely proven, the position should be reported to the Harvard College Observatory."

Since its discovery on Sept. 13 the comet has moved into the part of the sky near the sun and is lost in the twilight. A cablegram from the Carter Observatory, Wellington, New Zealand, sent in reply to a request from Mr. Cunningham, states that the comet was last observed on Sept. 16.

At the time of its discovery, the comet was of the fifth magnitude and so was faintly visible to the naked eye. Three days later, however, it had faded to the sixth or seventh magnitude, and required a small telescope to see it. Unless the comet is accidentally rediscovered after it emerges from the morning twilight, its orbit will remain unknown.

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PSYCHOLOGY

Better Brain Wave Record

Use of television techniques suggested as aid for understanding the mechanism of mental activity. Lack of suitable instruments only bar to plotting brain messages.

➤ ELECTRICAL engineers who have solved the scanning problem in television could help solve the technical problems now hampering scientists trying to understand the mechanism of mental activity through study of the electric potentials of the brain, Dr. R. W. Gerard, physiologist of the University of Chicago, declared at the National Electronics Conference in Chicago.

Only lack of suitable instruments, he said, "prevents the plotting of every single message which travels anywhere in the brain."

The philosophical arguments over whether man has a free will might some day be settled on the basis of physical measurements of electrical activity in the brain, he hinted.

Such measurements, in the form of brain wave tracings, have already told scientists some things about brain activity and make possible the detection of unsuspected epilepsy, location of brain tumors, and the like.

"By all means the most dramatic thing about the brain waves," Dr. Gerard said, "is that they exist with the subject at rest and are actually fragmented by activity. The main, or alpha, rhythm is most pronounced in a person sitting relaxed in a dark room. Mental effort, mild emotion, or sensory stimulation, especially by light, disrupts it. Experiments on other animals, notably the frog, prove what the human observations suggest; that the brain has a spontaneous electrical beat, as automatic as that of the heart, which is modified by but not dependent on outside stimulation.

"This major discovery has changed our thinking about the brain; from the picture of a passive telephone system which is inactive unless receivers are up, to one of a system in continuous activity and able to start its own messages as well as to receive others. This does not yet quite make a place for free will but it does fit far better with the facts of conscious experience."

Among problems still to be solved is how metabolic energy is transformed into rhythmic membrane potential waves. The membranes which surround all living cells, Dr. Gerard explained, are differentially permeable to ions and become polarized or charged as condensers. They are kept charged, commonly to about 50 millivolts, by energy released in the course of cell metabolism, mainly by the oxidation of sugar.

Besides the transmembrane potential, there is evidence of another maintained potential from end to end of the nerve cell but no clue as to how it is produced.

"The myriad cells, arranged in fairly regular layers in the brain cortex, beat in synchrony to a large extent—it is only then that the brain waves are ordinarily measurable—but also form spacial activity patterns and are modulated by incoming nerve signals," Dr. Gerard stated. "Part of the synchronization mechanism, at least, does not depend on nerve messages but probably on electric fields of wide extent, and these may also contribute to the spacial patterns. These problems cannot be resolved by leading from the scalp even with dozens of electrodes, the spacial variations are too great and the pick-up too wide-spread.

"One line of research, possible on man only when head operations permit work on the exposed brain, but widely applied to animals, is to insert microelectrodes into known brain regions or even, with microscopic accuracy, against or into particular nerve cells. This latter maneuver has permitted the direct measurement of membrane potential, impedence, etc., but it demands further improvement in high-resistance input voltage amplifying systems.

"Another direction of movement has

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been indicated by the use of large numbers of macroelectrodes on scalp or brain to permit a spacial sampling of the surface potentials of a whole brain or a large area of it. The present sampling is, of course, inadequate and, worse, with but a few channels these must continuously be switched from one set of pick-up leads to another. The problem seems to me entirely comparable in principle to the scanning problem in television. There also, the potential contours of a surface must continuously be measured. You have solved the television problem in several ways; I am convinced that you could help us solve ours with your present knowledge."

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PUBLIC HEALTH

Mental Health Plan

A program to rebuild the mental health of homeless trailer children who have had an unfortunate start in life due to the war will be necessary.

➤ A TOTAL health reconstruction program to conserve America's human resources after this war should include a plan for rebuilding the mental health of homeless trailer children who have an unfortunate start in life due to the war, Dr. Robert V. Seliger, of the Johns Hopkins University Medical School, told a New York meeting of the Medical Correctional Association.

"Think," he said, "of the thousands of migrant families in America over the last decade only, their 'home' a rented room or trailer; their children's schooling interrupted or discontinued because of 'seasonal' jobs; their community roots and ties centered in, and delimited by, the poolroom and movie house.

"These children, whose lives are existences merely, tunnelled through with emotional maladjustments, insecurity, confusion of purposes in life, lack of community fellowship or 'belongingness', improper, inadequate diet and a blighted family life, are the juvenile delinquents of today and the citizens of tomorrow. They will make and enforce our laws. They will bring forth children of their own. If such conditions remain unremedied, only a feebleminded optimist could look to a bright new future.

"We have, therefore, much more to deal with than mental illness as such. We have to deal with a total health problem for the individual and for the community."

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Treatment for Criminals

➤ A TYPE of criminal considered the most dangerous, irritating and persistent —those known as psychopathic personalities—can be successfully treated by a new kind of mental therapy, called hypnoanalysis, Dr. Robert M. Lindner, of the U. S. Public Heath Service, told the meeting.

The method is a sort of combination of hypnosis and psychoanalysis and succeeds where ordinary psychoanalysis would be a failure due to lack of cooperation on the part of the criminal, he said. It requires much less time than psychoanalysis; no one case taking more than 50 hours of the physician's time. There have been no failures, he said, except in cases where for extraneous reasons the treatment was discontinued.

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Courts Need Psychiatrists

➤ UNIFORM provisions are needed for the mental examination of defendants coming before Federal courts, Dr. Lawrence F. Woolley, clinical director of the Sheppard and Enoch Pratt Hospital, Towson, Md., told the meeting.

Although, under an excellent law which became effective in 1936, the Public Health Service is authorized to appoint a panel of psychiatrists for each Federal jurisdiction to give impartial advice to the Court, actually this law is not being fully carried out, Dr. Woolley revealed.

In some Federal jurisdictions the opportunity is welcomed, and panels of qualified psychiatrists were created and are being used, he said. But in other jurisdictions, nothing much has been done.

Even where the panel of experts is available, he indicated, a defendant in court is not always examined. It depends to some extent upon the recognition of a problem in psychiatry by someone interested in the court proceedings.

Dr. Woolley urged the routine examination of all defendants. The psychiatric report should do more than give a statement as to the sanity of the defendant, he said.

"We have progressed sufficiently in this field to recognize that such a statement is the least valuable part of the record. More to the point would be formulations which enable the various interested parties to understand the personality of the defendant, the forces playing upon him and the dynamics of his behavior. This insures a fair accuracy of prediction as to the future conduct of the defendant and makes possible the carrying out of a program best calculated to prevent recurrence and insure rehabilitation when possible."

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SEISMOLOGY

Turkey's Earthquake in Same Region as Before

➤ THE STRONG earthquake recorded in the interior of Turkey late on the night of Oct. 5, and reported to have taken 50 lives, had its center in the same general region as the serious quake of Feb. 1, 1944, U. S. Coast and Geodetic Survey seismologists believe on the basis of reports received by them and Science Service from Georgetown University, Weston College, Mass., St. Louis University and the Coast and Geodetic Survey station at Tucson, Ariz.

The epicenter is placed, from these reports, in the region of 39 degrees north latitude and 32 degrees east longitude, which is about 100 miles southwest of Ankara. The Feb. 1 earthquake had its epicenter at 41 degrees north latitude and 31 degrees east longitude.

It is believed that other parts of Turkey, east of Istanbul, have also been shaken.

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ASTRONOMY

Double Star Is Composed Of Two White Dwarfs

➤ THE FIRST double star of which both components appear to be white dwarfs has been located by Dr. W. J. Luyten of the University of Minnesota, according to a report to Harvard College Observatory.

The double star, LDS 275, is located in the southern constellation of Antlia, the air pump. The two white components appear to be of about equal brightness, their photographic magnitudes being 14.1 and 14.4.

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PUBLIC HEALTH

Drafts Do Cause Colds

It is not an old maid's notion that it is not wise to sit in drafty places. A scientific investigation shows temperature changes affect number and severity of colds.

➤ THE LAYMAN'S ideas that sudden drops in temperature are likely to bring on a cold and that drafts have something to do with catching cold got scientific confirmation in a report by Dr. Joseph H. Kler, of New Brunswick, N. J., to the American Academy of Ophthalmology and Otolaryngology meeting in Chicago.

In a study of colds among 5,500 employees of Johnson and Johnson in New Brunswick and Chicago from July, 1942, to February, 1944, Dr. Kler found that every sudden drop in temperature was followed in a day or two by a rise in the number of colds.

Shipping departments, which are usually drafty places, he also found, had uniformly a high general incidence of colds and a high incidence of time-losing colds. There were fewer colds in air-conditioned plants.

Sex, age and the working posture were also found to have a bearing on the number and severity of colds. There were many more time-losing colds among women throughout the year, and what Dr. Kler believes may be fully as important in the increased severity of colds, the majority of colds in women came at the menstrual period.

The largest number of colds occurred in the 20-29 year age group and the lowest in the age group above 50 years. The percentage of time-losing colds, however, increased with age.

There were consistently more colds among office employees than among factory employees. Posture also had a marked influence on the severity of colds. The smallest percentage of time-losing colds was found among those who walk about at their jobs and the highest among those who mostly sit at their jobs.

Smoking apparently had little effect on colds. Almost half, 45%, of those with colds did not smoke at all. The influence of vitamins on incidence and severity of colds was "questionable."

Early treatment seems to be of greatest value at present, Dr. Kler said. The number and severity of colds was greater in Chicago than in the New Brunswick plant and offices, but the time loss was lower. This is explained, he believes, by the fact that much more attention was paid to treatment of colds in Chicago.

Colds came in cycles, the peaks being in December and October. The December peak is the highest. The low point of incidence is in July. Besides this seasonal variation, Dr. Kler found a relation between colds and week-ends. In New Jersey during the winter the largest number of colds started on Saturday, while during the rest of the year a slightly larger number started on Mondays. In Chicago almost as many colds started on Monday as on all other days of the week combined. This week-end factor showed more among the men than the women and was not related to temperature changes.

In urging further investigations on the common cold, Dr. Kler pointed out that they are responsible for more than one-third the total number of days lost in American industry. They cause a productive time loss of 100 million working days each year with an annual cost of one-half to two billion dollars.

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MEDICINE

Fever Chemical Discovered

➤ DISCOVERY of a chemical that apparently is the cause of the fever that comes with inflammations is announced by Dr. Valy Menkin, of Duke University School of Medicine (*Science*, Oct. 14).

It is a nitrogen-containing substance which Dr. Menkin has christened pyrexin, following the medical custom of using the word pyrexia, borrowed from the Greek, for fever.

Pyrexin was obtained from inflammatory discharges such as that in pleurisy. Blood serum containing hemoglobin from ruptured red blood cells also contains the chemical. This suggests that pyrexin is liberated from red cells ruptured in the course of injury or disease.

The chills and fever of malaria may be due in part at least to release of pyrexin from the red cells.

Boiling does not destroy the fever-inducing action of pyrexin and tests with mice and rabbits show that it is not injurious to animal tissues. It may, therefore, be valuable in treating central nervous system disorders, for example, Dr. Menkin suggests, for fever treatment of syphilis of the central nervous system.

Pyrexin's mode of action, he believes, may be on fever centers in the hypothalamic region of the brain.

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AGRICULTURE

Tropical Farming School Opened in Honduras

➤ A SCHOOL of Pan American agriculture was formally opened Thursday, Oct. 12, to provide technical education in American tropical agriculture particularly for students from Mexico, Central America and the West Indies. Its faculty includes scientists and educators from Middle America and from the United States.

Escuela Agricola Panamericana is the official name of the new institution of learning. It will be conducted as a practical work-while-learning laboratory, furnishing free and expert technical training to a permanent enrollment of at least 160 young men carefully selected from Middle America.

When their training is completed, students of the School of Pan American Agriculture are expected to apply their technical knowledge and experience to the problems of their home lands.

The opening of this technical school promises to be an event of more than local interest. As a result of the war Middle America is now supplying the United States with products formerly obtained in the Far East, and will probably continue to do so in the future because of the great agricultural developments that have already taken place. The Western Hemisphere may become agriculturally self-sufficient. To promote this self-sufficiency is one of the objectives of the new institution.

The Escuela Agricola Panamericana was founded and is endowed by the United Fruit Company, but will be divorced from the personnel requirements of any particular company or commercial employer. It will function under a board of regents, five of whom are Central Americans. Its establishment and location were authorized by the National Congress of Honduras.

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NUTRITION

Europe Needs Fats

Shipments of substantial quantities of fats and of smaller amounts of canned and dried milk and meat will be seriously needed by liberated peoples.

➤ OVERSEAS shipments of substantial quantities of fats and of smaller quantities of canned and dried milk and meat will be seriously needed in liberated areas in Europe to feed the civilian population for weeks and months after fighting ceases. This is a conclusion of the Food Research Institute of Stanford University in a recent study of livestock in western continental Europe during the present war.

The study covers the livestock situation, and the production of meats and animal products, in all the countries of continental Europe except the Soviet Union and the Baltic states. Large shipments of feed grains for cattle, sheep and poultry, along with the early shipment of foods, will assist the situation as farmers will then be able to feed their existing stock more adequately and take steps toward rebuilding their pig herds and poultry flocks.

"With substantially more feed available, the production of milk and eggs should increase within a few weeks; within a few months, the increased feed rations should be reflected in gradually rising slaughter weights of meat animals," the report of the study states, "and within a year, the enlarged pig herds and poultry flocks should be yielding much more meat and fat than at any time since 1940-41."

Through the fifth year of World War II the livestock position in the portion of Europe studied "has deteriorated significantly less than it did in 1914-18," the report continues. "Cattle, sheep and horses have declined moderately in number during the past five years, and sharp reductions have been registered only for pigs and poultry. The lowest point in animal numbers apparently came in 1942-43. Since then many countries have reported moderate increases."

The areas studied lost some 6,000,000 cattle, 7,000,000 sheep, and 21,000,000 pigs, but these losses represent roughly 7% of the cattle and sheep and 30% of the pigs. Poultry losses were about 20% of the prewar figure.

The production of meat in 1943-44 "amounted to something like three-fourths of the average annual output in the last five prewar years . . . . the total output of milk in 1943 may have amounted to about 85% of the 1934-38 average." Millions of men in the Axis armies and millions of workers in war industries and farmers received far more than their average share of the meat and dairy products so that very little meat, butter or cheese was left for ordinary urban civilians.

Wartime declines in cattle and pig numbers were largest in the German-occupied countries of northwestern Europe. More or less declines in cattle numbers may have occurred in Finland, Poland, Yugoslavia and Greece, but these countries probably suffered less losses of pigs than the Low Countries and Norway.

"The most serious shortages of animal products, as well as food in general, will be encountered in the large cities," the study concludes. "It can satisfactorily be met only if Allied occupation authorities take proper steps to establish proper rationing systems and reduce black-market operations."

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ENGINEERING

Inactive Radio Crystals Put Back in Service

➤ OVER 50,000 radio transmitter crystals have been salvaged from battle-damaged U. S. military planes and put back into service, thanks to a crystal tester.

Invented by Technical Sergeant James T. Johnson, radio technician at an aircraft repair and modification depot in England, the tester instantly gives a visual picture of the exact frequency of the crystal, and at the same time indicates the crystal's ability to stand up under the vibration of a plane in flight. Prior to this machine, no quick method of checking crystals accurately was available.

Quartz crystals are used in radio transmitters to maintain the operation of the radio waves sent out on an assigned frequency. They prevent a radio station or radio telephone from being heard at one point on the dial at one time, and at another point on the dial another time.

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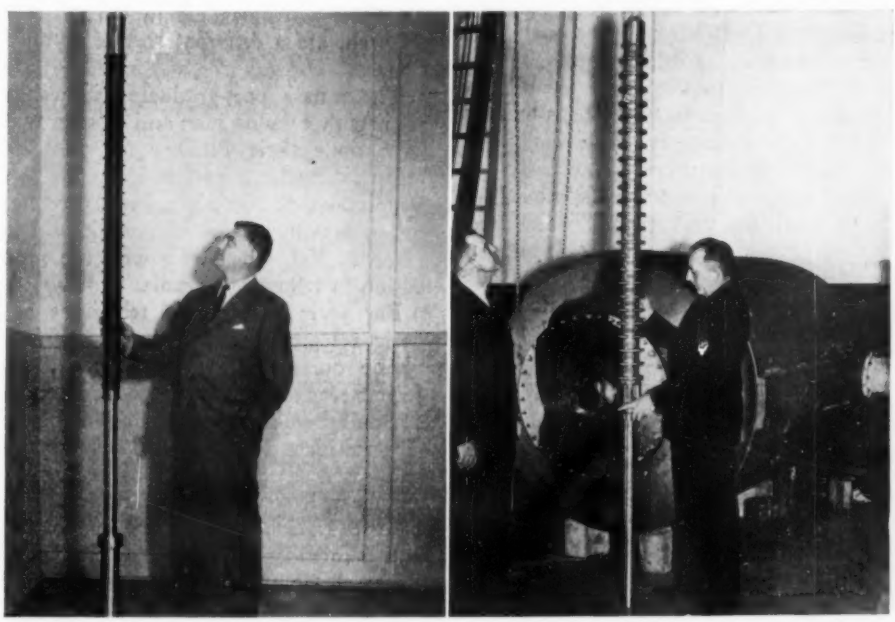


2,000,000-VOLT X-RAYS—R. R. Machlett, (left), is shown with the new Machlett precision two-million-volt X-ray tube. Dr. Ernest E. Charlton and Harry Mesick (right), of the General Electric Research Laboratory, are shown examining their nine-foot two-million-volt multisection X-ray tube. These new high-volt tubes make it possible to get pictures through extremely thick sections of steel. (See SNL, Oct. 14, p. 243).

PHOTOGRAPHY

Exposure Control for Use On All Standard Cameras

➤ PATENT 2,360,256 has been awarded to Joseph Mihalyi of Rochester, N. Y., for an exposure controlling mechanism for cameras which does not require any material changes of the standard camera structure and can be added to cameras now on the market. The patent has been assigned to the Eastman Kodak Company of Rochester. With its use any standard camera is turned into a semi-automatic exposure control mechanism. It is adapted particularly for use with cameras of the type which include an objective, an adjustable diaphragm, a variable speed shutter and a view finder.

Science News Letter, October 21, 1944

CHEMISTRY

Three-Metal Coating Protects Instruments

➤ A THREE-METAL plating process, by means of which an extremely thin coating of copper, tin and zinc is applied electrolytically to the surface of instruments and delicate instrument parts to protect them from corrosion, has recently been perfected in the laboratories of the Meter Division of the Westinghouse Electric & Manufacturing Company. The "bright alloy plate," as the coating is called, is non-magnetic and therefore particularly valuable for use on precision electrical instruments.

The new coating is of especial value on electrical instruments used by the armed services in the tropics, where the high humidity and the salt air cause severe corrosive action under which instruments deteriorate rapidly and lose their accuracy. Instruments coated with the bright alloy plate, subjected to 200 hours of continuous salt spray, show no signs of corrosion, or even any accretions of salt particles.

Perfection of a three-metal plating method has engaged electrochemists for several decades. When, in 1940, it became evident that the commonly used plating metals would quickly become hard to obtain, George W. Jernstedt, a Westinghouse research engineer, began work on the bright alloy plate. Single metal and some bi-metal plating materials had been quite fully developed. His problem was the improvement of the physical qualities of the protective coating by the addition of a third metal, and particularly the development of techniques that would make their application practical.

In describing the new process, Mr. Jernstedt says, "Formerly, with multiple-metal platings, the metals were put into the solution in the form of salts; but in depositing a three-metal alloy this method often resulted in inconsistent proportions of metals or uneven thickness of coatings on the plated object, or cathode. If the anode, the starting point of the current passing through the bath, could be made of the metals to be deposited . . . it could be immediately dissolved, making possible a properly controlled three-metal process."

The new method uses an anode composed of the three metals to be deposited. A chemical salt is also used in the bath which helps the plating alloy penetrate the narrow crevices in the object being plated, and reduces the size of the crystals of deposited metal so that they lie flat making a smooth finish.

Science News Letter, October 21, 1944

GENERAL SCIENCE

Jewett Fellowships Set New Style in Honors

➤ MANY GREAT engineers and scientists have buildings and medals named for them when they are dead, but the five new A. T. & T. research fellowships in honor of Dr. Frank B. Jewett, one of the most active leaders in current war research, are a different sort of recognition.

These new post-graduate fellowships are bets that young men and women who have done their Ph.D. work will develop as creative scientists. Each recipient will receive $3,000 a year and the institution at which they will work will be given $1,500, which is a welcome innovation in fellowship grants.

For years a leader in telephone and basic research for the American Telephone and Telegraph Company, Dr. Jewett reached the company's retirement age and therefore relinquished his post as vice-president in charge of development and research at the end of September. But he will continue to be the president of the National Academy of Sciences and a member of the National Defense Research Committee, a top war research organization.

A committee of seven scientists from the Bell Telephone Laboratories will select those who will be given an opportunity to continue their academic researches in physics, mathematics and chemistry, and the first fellowships will begin July 1 next.

Science News Letter, October 21, 1944

IN SCIEN

AERONAUTICS

10,000 Horsepower Gas Turbine Engines Possible

➤ GAS TURBINE engines for aircraft, approaching as much as 10,000 horsepower, may be available within the next decade, G. W. Vaughan, president of the Wright Aeronautical Corporation, reported.

While the principles of gas turbines have been known for years, it was only recently that research has improved their efficiency to a point of practical use and only recently that advances in metallurgy have provided the metals to withstand the heat and power stresses of such engines, he pointed out.

In the high-power range, the gas turbine has many advantages, Mr. Vaughan stated. It offers a large saving in weight and fuel consumption for long range operation at high altitudes. On a giant transport plane of the future, the gas turbine engine may mean a saving of as much as 8,000 pounds over present types of engines, permitting about 40 more passengers to be carried on each flight, or four extra tons of cargo. The use of the gas turbine engine is therefore expected to make possible sharp reductions in passenger fares and cargo rates.

Science News Letter, October 21, 1944

INVENTION

Meat Smoked and Cooked At Same Time in New Oven

➤ A SMOKE OVEN, in which meat or fish can be smoked and cooked at the same time, is the subject of patent 2,352,590, granted to R. H. Trinkle of Chicago, who has assigned his rights to the Industrial Patents Corporation.

The smoke oven is a highly sophisticated advance over the old-fashioned farm smoke-house. It consists of a closed chamber in which the products to be smoked are placed. The smoke is generated outside, in a separate apparatus, and carried in by a blower; "spent" smoke is removed in the same circulation. Temperature and humidity, as well as smoke, are automatically controlled, and temperature is kept at such a point that the meat is cooked by the time proper smoking has been accomplished.

Science News Letter, October 21, 1944

NE FIELDS

RADIO

Design of FM Receivers Reduces Interference

➤ A NEW advance in the design of Frequency Modulation receivers reduces interference from undesired stations in the reception of FM radio programs, George L. Beers, of the Radio Corporation of America, the inventor, reports.

The FM receiving system represents a new approach to the problem of reducing noise and interference. Known technically as a "frequency-dividing locked-in oscillator FM receiving system," it consists of an oscillator which automatically adjusts its frequency to the frequency variation of the signal of the desired FM transmitter, Mr. Beers stated.

"Frequency modulation," Mr. Beers pointed out, "is still in its infancy in terms of a nationwide entertainment service. Until a large number of high-powered FM broadcasting stations are operating on a commercial basis, the major technical problems which are involved in the design of FM receivers will not be fully appreciated."

Science News Letter, October 21, 1944

ENGINEERING

Gas Turbines May Give More Power to Locomotive

➤ RAILROAD locomotives of the future may have gas turbines instead of the present steam engine, making them more powerful and efficient, Fred K. Fischer, of the Westinghouse Electric & Manufacturing Company, predicted at a joint meeting of the American Society of Mechanical Engineers and the American Institute of Electrical Engineers, held in Hartford, Conn.

The gas turbine engine, he pointed out, requires no water, takes up less space and weighs less than the steam engine. It also has very low maintenance cost.

Although the gas turbine is still in an early stage of development, Mr. Fischer asserted that when applied to locomotives, it can yield considerably more power than is possible with the present steam engine, and it can do it with twice the efficiency.

While gas turbine airplanes are already flying, he predicted that other uses for the gas turbine will be found in ship drives, larger electrical power generation stations as well as industrial uses.

The advantage of the gas turbine, he stated, lies in its simplicity, since it consists of only three major elements, namely: a compressor, a combustor and the gas turbine itself.

Science News Letter, October 21, 1944

ASTRONOMY

Preparations Being Made To Study Total Eclipse

➤ PREPARATIONS are already being made to observe the total eclipse of the sun on July 9, 1945, in northern Sweden. Great interest has been shown in this solar eclipse, according to a report from Dr. Bertil Lindblad, director of the Stockholm Observatory in *Monthly Astronomical Newsletter,* prepared at Harvard Observatory to help make up for the world-wide exchange of astronomical information disrupted by the war.

The path of the total eclipse, which will begin near Boise, Idaho, passes through Butte, Mont., and Yorkton, Canada. Crossing Hudson Bay, it goes through lower Greenland, into northern Scandinavia and on into the U.S.S.R.

Northern Sweden will be a good place from which to observe the eclipse. It will begin there in the early afternoon at about two and end at approximately four o'clock, Swedish standard time.

Science News Letter, October 21, 1944

NATURE

Young Fairy Tern Provides Entertainment for Sailor

See Front Cover

➤ THE young Fairy tern, shown on the front cover of this SCIENCE NEWS LETTER, is being fed by a sailor somewhere on Midway. G.I.'s everywhere find this sort of entertainment welcome and relaxing in their infrequent spare moments.

Terns breed usually on sand dunes and shingle banks and lay up to four eggs, two being the commonest number, and great variation occurring with the season and locality. They are said by fishermen to damage the fishing, but this has proved to be a mistake, the birds feeding largely on crustacea, insects and sand eels. They obtain their food by plunging into the water from a height of 3 to 8 feet, and emerging with it in their bills.

Science News Letter, October 21, 1944

MEDICINE

Unbalanced Body Chemistry Factor in Rheumatic Fever

➤ AN UNBALANCED chemical condition in the body may play a role in rheumatic fever, it appears from studies reported by Dr. Karl Meyer and Dr. Eleanor Chaffee, of Columbia University College of Physicians and Surgeons.

The unbalanced condition apparently is caused when a heavy, sticky organic acid, ordinarily found in the fluids between the joints and in other organs of the body, is produced in excess at the same time that there is insufficiency or failure of an enzyme that can break up the big acid molecule.

The acid is a polysaccharide called hyaluronic acid. The enzyme that decomposes it is hyaluronidase. The acid in its heavy form is not found in normal blood. A substance closely resembling it, however, has recently been found in red blood cells of rheumatic fever patients.

Tests with samples of blood from patients led the scientists to conclude that the acid does exist in the big molecule form in rheumatic fever. These tests were made by adding an anti-clotting substance to the blood sample and letting it stand in very fine-bore glass tubes.

In rheumatic fever and a number of other diseases the red blood cells settle out in these tubes at a much faster rate than normal. The rate of settling, the scientists found, can be increased by adding to blood sticky, heavy chemicals such as hyaluronic acid. Apparently the cells become coated with the sticky acid which makes them clump together.

The high rate of red blood cell settling in blood from rheumatic fever patients, they also found, can be brought to the normal rate in all cases by adding the enzyme, hyaluronidase, which decomposes the large acid molecule.

This acid, another group of scientists have found, is present in the outer coating of group A and C hemolytic streptococci. This seems significant since rheumatic fever is now generally assumed to be caused in susceptible persons by an abnormal response to previous infection with germs of the hemolytic streptococcus family.

What part the acid plays in the many symptoms of rheumatic fever remains to be seen, the scientists state, adding that the whole question of what part chemicals which, like hyaluronic acid, are highly asymmetrical polymers, play in various diseases must be studied.

Science News Letter, October 21, 1944

CHEMISTRY

Packaging for Protection

Packages, instead of being wrapped in paper, are now protected by sprayed-on coverings which keep the contents water-proof. Unwrapping means peeling off the film.

By CAROLINE PARKINSON

➤ A NEW washing machine arriving in a skin-tight package sprayed on before shipping will probably not amaze a returning serviceman as much as it will his mother when she receives it in the postwar future.

On duty at a debarkation center for war goods, soldiers have helped "unwrap" entire fighter planes. This involves peeling off the transparent, plastic film which has protected them from rain, sleet, and sea water on the passage across.

Beer in bags, a day's supply of cold cream in a gelatine capsule, and a tractor in a form-fitting package may be a postwar surprise for us, but old stuff for GI Joe. He knew them when they were new war weapons developed in the face of mildew in India, rains in New Guinea, and breakage in passage. By destroying one-fifth of all war goods before they could ever be used at the front, these damages of nature were a greater menace than submarine warfare.

New Wrappings

The most ingenious packages which we will see on the market in a few years are the ones devised to keep our equipment dry. The old way involved smearing fighter planes in waterproof petroleum compounds before loading them onto the deck of a transport. In the course of an ocean voyage, the greases would harden, and admit moisture through shrinkage cracks. At the end of the voyage, it took 250 man-hours of labor as well as large quantities of solvents to unpack one plane.

Today a new fighter plane first has its small openings covered with heavy tape, then larger ones with plywood filling. The entire plane is sprayed with three coatings of plastic film, based on a vinylite resin. The plane can be completely "wrapped" in two hours by a two-man team.

The transparent, form-fitting coat is elastic enough to flex with the movement of the plane and does not get brittle in sun, wind, or cold. Three or four soldiers can strip the plane in about an hour.

Refrigerators, washing machines, farm equipment, hydraulic presses and outboard motors may soon be shipped in spray-gun packages.

Another hero of the packaging front is the good old brown paper bag. Impregnation with a synthetic resin to give it wet-strength properties has allowed the paper bag to save valuable cargo space and weight. It carries vegetables, meats and chemicals, formerly packed in heavier metal containers.

Water-Proof Cartons

A paper board carton which can sit in steaming jungles or tumble in the surf for two weeks and still deliver the goods dry is another product of cooperation between chemist and paper manufacturer. Fresh fish surrounded by water ice can be sent back and forth across the country, packed in the V-board cartons.

Wet-strengthening, grease-proofing, dirt-proofing, heat-proofing, multi-wall processes have made cardboard so valuable that it is now on the critical list of materials along with the metals it has replaced.

While the Japs sneaked through the jungles to attack South Pacific forces from behind, tropical storms from above would rust valuable guns and equipment beyond use. So experts at home developed a plastic compound which would harden as a waterproof coating on machine parts dipped into it. It saves 60 to 90 per cent of the time required for conventional wrapping or wax dipping and will enable postwar industry to keep articles of machinery in stock indefinitely.

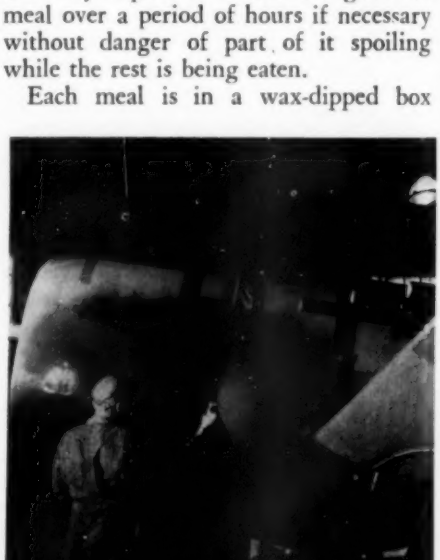
Metal machine parts are wrapped in transparent plio-film to keep them from rusting while waiting in assembly lines. Bags of silica gel are tied to the metal parts before wrapping to absorb any moisture from the air which has been trapped within the plio-film package. Silica gel is used because it is too inert to start up any chemical reaction with the metal finishes.

An ingenious color indicator enclosed in the package is used as a signal: when the upper limit of humidity is reached it changes color, which can be seen through the transparent plio-film. This means that the silica gel bags have absorbed their fill of water and must be recharged.

Plane parts and medical instruments come to the men at the front in laminated grease-proof, heat-proof transparent bags. Some day meat loaf and scrapple will come to the housewife in similar reinforced wrappings ready without washing to slip into a baking dish. Dill pickles will arrive brined in neat little packages of two. Cleaned, scraped and trimmed carrots, beets, and other vegetables will come in cellophane bags similar to the ones now sealed around airplane parts.

The Twin-Pack idea that enables the housewife to open one half of a loaf of bread and keep the other half fresh is regulation for Army K rations. The concentrated meat, biscuits, chocolate, and fruit of each meal are separately wrapped in grease-proof, moisture-proof paper. In this way a pilot in action can grab his meal over a period of hours if necessary without danger of part of it spoiling while the rest is being eaten.

Each meal is in a wax-dipped box



"LIQUID ENVELOPE"—A P-47 Thunderbolt gets a spray of hard skin which will protect it against wind and weather during its ocean voyage.

WELL WRAPPED—The food and equipment sent our troops must withstand all kinds of treatment. These provisions for Allied forces are shown being landed on the drab shores of the western Aleutians, in this U. S. Navy photograph.

which the Quartermaster has specified because it guarantees that the meal will be in good condition whether the soldier opens it in a steaming South Pacific jungle, in the baking heat of North Africa, or in the sub-zero cold of Arctic regions.

Wax paper replaces the aluminum foil around chewing gum and cigarets, thus releasing the metal for more direct use in war industries.

Open-Mesh Bags

When the supply of boxes and crates runs out, fruit and vegetable shippers use an open-mesh bag, made from strips of tough paper spun into yarn and woven into open-mesh cloth. They are made in various colors to contrast or harmonize with the contents. Because of their low cost, space and weight saving, and ease in filling and closing, they are likely to persist after the war as improvements instead of substitutes.

One of the biggest problems has been to design a method of packaging that would withstand sudden extremes of temperature. A plane, for example, is loaded in a tropical jungle. It flies at high altitudes where the temperature is frequently 60 degrees below zero; it lands on another steaming jungle airstrip. To lick this air transport problem, Army Ordnance provides a type of container that expands and contracts without breaking the outer protective seal and covering.

The problem of breakage is solved by balanced rather than rigid packing. Heavy equipment is suspended by supports in specially constructed boxes. Like yolk in eggs, it remains balanced even when tossed around.

Today, gelatine capsules provide the gay colored camouflage for vitamin pills. Tomorrow, with stiff necks and screw tops, they will package a day's supply of shaving cream or perfume. Flavoring extract, and cigaret lighter fluid in individual containers will be the peacetime versions of the gelatine capsules now substituting for metal and plastic tubes in the soldiers' kits.

Automatic filling, uniform dosage, low-cost, high-speed production, long-term protection and sanitation are the obvious advantages of capsule packaging. We may look forward to having these gay capsules, containing just enough toothpaste or cold cream for our week-end visit, become a standard part of our peacetime traveling equipment.

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The *Oranje mountains* in New Guinea have many snow-capped peaks, although they are very close to the equator; they are over 15,000 feet high.

CHEMISTRY

Unusual Body Chemical Acts as Storage Depot

➤ AN UNUSUAL body chemical with the specific job of acting as storage depot for iron for the blood was announced by Dr. Leonor Michaelis and Dr. S. Granick, of the Rockefeller Institute for Medical Research, at the meeting of the American Chemical Society in New York.

The chemical is a protein called apoferritin. When it contains iron, it is called ferritin. Neither ferritin nor apoferritin is found in the blood, but ferritin is found in many organs of the body. The ferritin of one animal species is not quite identical with that of another, but within one animal species, it is the same whether derived from liver, spleen, bone marrow or blood.

Apoferritin is a novel type of protein, differing from all other protein compounds of the organism. The iron it stores is rather special, too, in that its magnetic property or susceptibility is of a magnitude not found in any other of the normally occurring iron compounds of the living organism and extremely rarely in iron compounds in general.

The role of apoferritin, the scientists reported, is to store the iron from food or from blood cells used up by age and decay and to make the iron available for manufacture of fresh hemoglobin. Hemoglobin is the red coloring matter of the blood which has the vital role of carrying oxygen throughout the body.

"Why a particular, specific protein is needed to accumulate iron for storage remains a puzzling problem," the scientists stated. "In any case the iron of ferritin accounts nearly quantitatively for all of the iron of the organism which is not a blood pigment or a derivative of such."

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Do You Know?

A severe shortage of trained *metallurgists* is anticipated after the war.

Sweden is constructing a $2,000,000 plant to make *artificial rubber*.

On many hand tools *plastic handles* have replaced those formerly of wood or metal.

Over 1000 different *chemicals* are used in building an army tank and over 2000 in making a battleship.

Shellac is the only commercial resin obtained from animal chemical reactions.

The thickest known *coal seam* in the world is in a mine near Cologne, Germany.

Crude oil production in Colombia, South America, was nearly 2,000,000 barrels, in March, 1944.

The *buri palm nut* of Brazil may become an important source of table oil; this palm is botanically Diplothemium candescens.

The *alligator weed*, one of the greatest pests in southern sugar fields, may be controlled by flame treatments, recent tests indicate.

RADIO

Education by Radio

Young scientists and school clubs will play an important part in making this means of education pleasant and simple for adults and children alike.

➤ YOUNG scientists and school clubs will play an important part in making education by radio simple and pleasant for adults and children alike, Dr. Harlow Shapley, director of Harvard College Observatory, Cambridge, Mass., predicted in testimony at the Federal Communications Commission hearings held in Washington to study the needs of various radio services in the postwar era.

Pointing to Science Clubs of America, a nationwide organization with a total membership of about 125,000 high school science students, Dr. Shapley stated that the young scientists of these clubs can play an important part in education by radio, if frequency modulation stations primarily for educational broadcasts are established in large enough numbers.

These school clubs can assist in the technical operation of local broadcast stations; be useful in working out the technical details of program production; provide local scientific materials appropriate for educational programs; and adapt for local use radio material supplied them by the national headquarters of the organization.

Science clubs have already successfully demonstrated their ability to participate in educational radio programs, Dr. Shapley stated. He cited the excellent work now being done by various science clubs participating in weekly Sunday morning programs broadcast by station WTAG, in Worcester, Mass. The subject material of the programs ranges from victory gardens to poisonous plants, and from discussions of the solar systems to gallinippers (insects).

Many adult citizens have learned through these programs that their community is well stocked with energetic young experts in many fields, Dr. Shapley commented.

There are now more than 5,000 individual Science Clubs of America representing every state in the union. From headquarters in Washington, D. C., under the auspices of Science Service, the parent organization, these clubs are provided extensive servicing and guidance without cost to the clubs themselves. Among the many activities of these clubs, administered by Watson Davis, the director, and Miss Margaret Patterson, the general secretary, are the collection of rainfall data for the national Weather Bureau, and the location of sites for suitable airplane landing fields, Dr. Shapley remarked.

In addition to the science clubs, Dr. Shapley added that other school and community organizations, such as little theater movements, will provide local educational radio program material.

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INVENTION

Electric Vaporizer for Head Colds Is Patented

➤ HOT medicated vapors, for inhalation in the treatment of head colds, sinus infection, catarrh and other head troubles, will be easily obtainable in the future with a hand-type electric vaporizer for which patent 2,358,349 has been granted to Joseph Robinson of New York City. It has been assigned to William R. Warner & Company, Inc., also of New York.

The vaporizer contains in combination a base, a switch terminal and electric cord, and a heater-container applicator unit seated on the base but which can be picked up separately from it. A nozzle for directing the vapors created is also included. The unit is so constructed that it retains the heat for a period after the unit is removed from its base.

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BOTANY

NATURE RAMBLINGS

by Frank Thone

Life Everlasting

➤ GENERATIONS of poets have perpetuated a dismal autumnal picture of "melancholy days, the saddest of the year," with trimmings of wailing winds and "leaves both brown and sear."

It isn't fair. Autumn is a grand season, a time of both fulfilment and preparation. And for the trees that shed their leaves it is no more a time of doom and death than any other season of the year. The leaves die and drop off, it is true, but the trees themselves stand and survive; they are no more dead in autumn and winter than they are in spring and summer. We humans, egotists that we are, are simply reading our own feelings and reactions into beings whose lives are quite unlike our own. This kind of anthropomorphizing has a bad reflex effect upon ourselves, yet we're always doing it.

As a matter of sober scientific fact, the trees themselves are very business-like about this business of letting their leaves go. In their purely automatic, unconscious way they prepare for the coming winter and the spring that is to follow a great deal better than self-styled *Homo sapiens* manages his own future.

The first thing that happens, as the nights grow longer and chillier, is the draining back into the tree's branches and trunk of practically all the foodstuffs in the leaves. Leaves, as we all know, are the ultimate food factories, and during their active life always contain a good deal of sugar, starch and protein. That's why grazing and browsing animals eat them while they are green—nobody ever saw a deer, or even a goat, try to get a living out of fallen leaves.

After the foodstuffs have been drained out of the leaves, the green coloring matter that helps to make them breaks down chemically, and in doing so becomes colorless. It is then that the leaves begin to glow in their autumn glory of yellows and reds and purples. These colors have been there all the while, the yellows as microscopic solid bits of pigment, the reds and purples as dissolved dyes in the cell-sap. Only during the summer there is so much more of the green pigment in most leaves that it covers up and masks the bright hues.

While the color change is going on, a double layer of cork cells forms right across the base of the petiole, or leaf-stem. It is the only common case in nature of a bandage being applied before a wound occurs. After this cork layer is formed, it splits apart, one half going with the leaf, the other covering the scar on the branch and sealing it against the entry of decay-causing germs and spores. And so the leaf drops off.

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• Books of the Week •

ANYTHING A HORSE CAN DO—Col. H. F. Gregory—*Reynal & Hitchcock*, 243 p., illus., $3.00.

CAREERS AND MINERAL INDUSTRIES—Pa. State College School of Mineral Industries, 24 p., paper, illus., free. Pennsylvania State College Bulletin, Circular 17.

CONTROL OF GERMANY AND JAPAN—Harold G. Moulton and Louis Marlio—*Brookings*, 116 p., $2.

FOSTER HOME CARE FOR MENTAL PATIENTS—Hester B. Crutcher—*The Commonwealth Fund*, 199 p., $2.00.

FROM MICROBE TO MAN—J. V. Wells—*Publications Press*, 106 p., illus., $2.

GENERAL METEOROLOGY — Horace Robert Byers—*McGraw*, 645 p., illus., $5.00.

HEALTH INSTRUCTION YEAR BOOK, 1944 —Oliver Erasmus Byrd, comp.— *Stanford Univ. Press*, 354 p., $3.00.

THE NATURALIST'S LEXICON — Robert S. Woods, comp.—*Abbey Garden Press*, 282 p., $2.75.

OUR GLOBAL WORLD—Grace Croyle Hankins—*Gregg*, 89 p., illus., $1.32.

RADIO: FUNDAMENTAL PRINCIPLES AND PRACTICES — Francis E. Almstead and others—*McGraw*, 219 p., illus., $1.80.

THE TEACHER'S WORD BOOK OF 30,000 WORDS—Edward L. Thorndike and Irving Lorge—*Teachers College, Columbia Univ. Press*, 274 p., $2.85.

THE TECHNIQUE OF HANDLING PEOPLE—Donald A. Laird—*McGraw, Inc.*, illus., $1.75.

THE UNIVERSE AROUND US — Sir James Jeans—*Macmillan*, 297 p., illus., $3.75, 4th ed.

VIRUS DISEASES IN MAN, ANIMAL AND PLANT—Gustav Seiffert—*The Philosophical Library, Inc.*, 332 p., illus., $5.00.

YOUR SERVANT THE MOLECULE—Walter S. Landis — *Macmillan*, 238 p., illus., $2.75.

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AERONAUTICS

Handicapped Can Fly, CAA Eases Restrictions

➤ THE LOSS of a limb, limitation of motion in joints and wasting of muscles, won't keep you from enjoying the pleasures of flying your own plane, if you can prove your ability to fly safely.

In an effort to simplify flying for the general public, the Civil Aeronautics Administration has made a new ruling under which physically handicapped applicants may obtain student and private pilot certificates without going through the long drawn out procedures heretofore required. The applicant's medical certificate, if he is otherwise qualified, bears a notation of his structural defect.

The applicant's instructor decides when he is competent to make a solo flight. When he has had sufficient experience and believes himself competent to pass a flight examination for a private pilot's certificate, he demonstratees his ability to fly to a CAA flight inspector.

Under the new ruling, only structural defects and not physical conditions due to active diseases are recognized. The Administrator of the CAA may limit the physically handicapped pilot to the operation of certain makes and models of planes, certain general types of planes, or to planes suitably remodeled for the individual concerned.

Other restrictions now in force on private flying are now being studied by the CAA with a view to revising them.

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•New Machines and Gadgets•

⚙ *SAWDUST-MAKING machine converts all sawmill wastes into a material resembling sawdust for use as fuel in home heaters burning sawdust. The resulting pellets may be used in making alcohol and plastics with the same equipment now used in making these products from real sawdust.*

Science News Letter, October 21, 1944

⚙ *CHILD HOLDER, for use in automobiles; permits the youngster to stand on the seat of a moving car without danger of falling. A strap, to pass around the child's waist, is fastened at its two ends to a pair of stiff, springy, inverted U-shaped hooks that are forced downward over the rear of the seat.*

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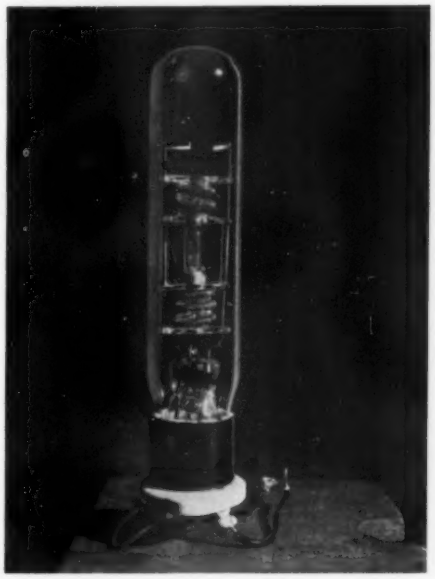
⚙ *COCKPIT HOODS on airplanes, made of transparent plastics, are now blown into shape much as a soap bubble is blown. Held at its edges by a ring which controls the shape to be obtained, the heated plastic is forced by air pressure to take the shape of a teardrop, from which the canopy is cut.*

Science News Letter, October 21, 1944

⚙ *MERCURY ARC LAMP, shown in the picture, is a new type that operates on 85 watts input and has specially designed heater coil to permit operation with a wide intensity range. It can be changed instantly from low to high intensities or vice versa. It was designed primarily for the motion picture industry.*



Science News Letter, October 21, 1944

⚙ *MOSQUITO-protection gloves, used in the U. S. Navy, permit guns and other equipment to be handled easily. They are made of a khaki-colored canton flannel, with a hole the size of a silver dollar in each palm, and the fingers and thumbs cut off at the first knuckle to provide ventilation and digital facility.*

Science News Letter, October 21, 1944

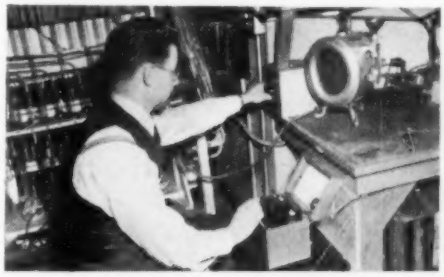
⚙ *IMITATION fur coats, made from the pelts of shorn sheep by a process that gives the pelts the properties of certain plastics, may become common at reasonable prices after the war. Those now made for the Army resemble beaver, but other imitations are possible. The new product is moth-proof and has excellent wearing qualities.*

Science News Letter, October 21, 1944

⚙ *DARNING DEVICE for use with a sewing machine is a U-shaped wire thread holder which can be attached to the fly-wheel to wind a layer of thread. Placed over a hole in the garment, the machine needle moves backward and forward to sew the threads and cloth together.*

Science News Letter, October 21, 1944

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, *1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin 230.*



Question Box

AERONAUTICS

What has made it possible for handicapped persons to get a license to fly? p. 270.

AGRICULTURE

Where is a new school of Pan American agriculture located? p. 262.

ASTRONOMY

In what constellations should you search to rediscover Comet Berry? p. 259.

What double star is composed of two white dwarfs? p. 261.

CHEMISTRY

How can packages be wrapped with a spray gun? p. 266.

INVENTION

How does a new electrical vaporizer for head colds work? p. 268.

MEDICINE

How can penicillin save babies? p. 259.

What fever chemical was recently discovered? p. 262.

What disease notion has been proved false? p. 259.

NUTRITION

What food will be needed most by the liberated peoples of Europe? p. 263.

PSYCHOLOGY

How may television aid in understanding the mechanism of brain activity? p. 260.

PUBLIC HEALTH

What part do drafts play in causing colds? p. 262.

Why is a program to rebuild the mental health of trailer children necessary? p. 261.

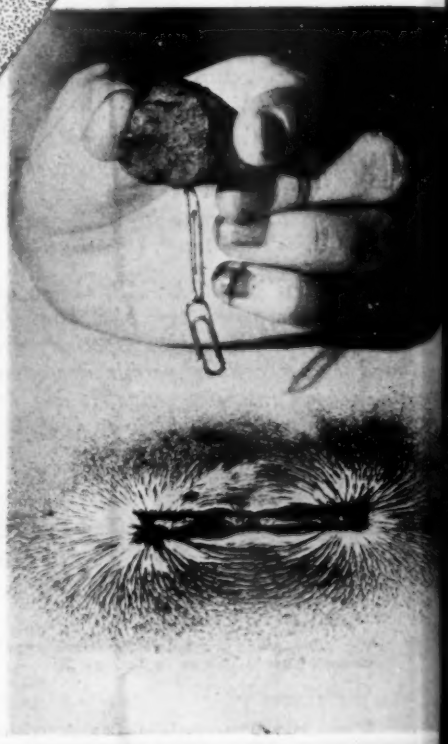
RADIO

How will education by radio be made simple and pleasant? p. 268.

Where published sources are used they are cited.

Every month our members get an unusual BLUE box or bulky envelope containing scientific material --novel, intriguing surprising

Current subjects: Rubber plants, Spice, Cotton, Dehydrated foods, War rubber, Lignin, Sweetness.

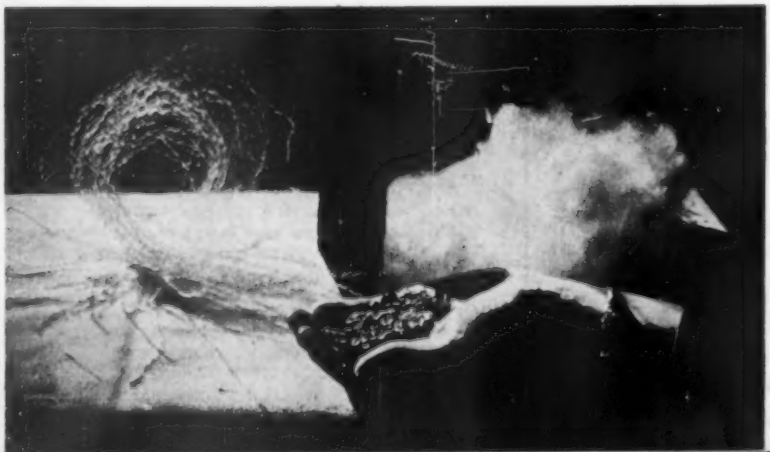


You are invited to join this Science Service group for trial membership. We shall send you each month an experimental kit of unusual scientific material. With each unit will come a brief, clear Members' Bulletin explaining the contents. For each item there will be a museum style legend card.

The membership charge has been set at $2 for a six months' trial. To those who send us the application form immediately we shall send an extra gift unit.

The total membership is limited to 5,000.

A few memberships are now available. Mail coupon today.



To Things of science

1719 N Street N.W.
Washington 6, D.C.

Please enroll me for Membership, sending me the current unit right away, the other units to come each month—a total of six monthly units of THINGS, all sent postpaid, for which I enclose $2. And send me, free, the Gift Unit offered in appreciation for my prompt acceptance of your invitation.

My name and address are correctly imprinted to the right.

OK_____
Signature